Midterm Free Response Questions – Please number responses & letter prompts where appropriate.

Directions: Answer all questions. Answers must be in paragraph format. Labeled diagrams may be used to supplement discussion, but in no case will a diagram alone suffice. Hand-write your responses NEATLY on lined paper. Each question is graded on a scale of 0-5.

1. 

1. Briefly **explain** how each process promotes movement of carbon through the carbon cycle with a focus on the role of energy in the transformation of the carbon compounds.
2. Identify an organism that carries out **both** process 1 & process 2.
3. Contrast the **mechanism** of ATP production in both processes.

2. **Explain** how the Hardy-Weinberg principle of genetic equilibrium can be used to **determine whether a population is evolving** by: describing 5 authentic scenarios in which evolution could be detected by **each** of the 5 conditions for Hardy-Weinberg equilibrium.

3. The flow of genetic information from DNA to protein in eukaryotic cells is called the central dogma of biology.

Explain the **role** of each of the following in protein synthesis in eukaryotic cells.

1. RNA polymerase
2. Spliceosomes (snRNPs)
3. Codons
4. Ribosomes
5. tRNA

4. Regulation is a key part of organism homeostasis. Explain the role of each of the following regulators in maintaining organism homeostasis and provide a specific example of a consequence if the regulator is disrupted.

a. Cyclins b. Plasma Membrane c. Cytokines d. Auxin e. Cytoplasmic Determinants